

# KLONDYKE POTATOES

By Maureen Bostock

**“While soil-building practices ensure fertility for future cropping,” says Marcus Koenig of Klondyke Farms, “weed control, disease prevention and pest management are the most important aspects of potato production to provide income.”**

**M**arcus Koenig farms 300 hectares (750 acres) near Grand Bend in southwestern Ontario. He grows 8–20 ha (20–50 acres) of organic potatoes each year, as well as corn, soybeans, alfalfa and small grains. He also raises Tamworth pigs and has a cow/calf operation finishing on grass.

The rotation begins with fields that have been in alfalfa for three years. Alfalfa is key to the soil program; it adds organic matter and improves soil tilth. Alfalfa is followed by small grains underseeded with red clover. Koenig then uses some fields for potatoes, while others are seeded to corn underseeded with a combination of red clover, Italian ryegrass and vetch. Barley follows potatoes if there is time to seed it before September 10th; otherwise, the field is seeded to soybeans in the spring.

The fields that go into corn may stay in a corn/soybean rotation for two or three years, depending on the health of the soil. The three-year rest period begins with fall or spring grains (oats) underseeded with permanent pasture.

**Klondyke Farms:** Marcus Koenig, Grand Bend, Ontario

**Cash crops:** alfalfa, soybeans, corn, potatoes

**Livestock:** Tamworth pigs, cow/calf

**Green manure:** alfalfa, red clover

**Irrigation:** centre pivot

**Soil:** sandy to heavy Brookston clay, pH 7.2–7.8

**Farm size:** 300 ha (750 ac.) with 8–20 ha (20–50 acres) in potatoes

**History:** certified organic by CSI since 2006

“We place as much emphasis on the cover crop as we do on the crop, particularly in the grain portion of the rotation,” says Koenig. The soil is worked when the red clover is plowed down. Then, either rye (on the sandy soils), or fall wheat or spelt (on the heavy soils) are planted.

Spring field preparation involves lightly working the soil with a rolling basket-style harrow that is 13.5-metre (45-ft.) wide with buster bars in front. This is repeated five or six times, while levelling the soil in front of the harrows to produce a fine seedbed with a crumb layer on the surface. The crumb layer prevents moisture from wicking off the soil surface; this is an important consideration in the hot summers of southwestern Ontario. One pass with the PTO-driven power harrow completes the soil preparation before planting.

Inputs are applied in the rows at planting. The formula is still being refined, but Koenig now applies 330–560 kg/ha (300–500 lb/acre) of a dry pelletized mix including calcium, rock phosphate, potassium, trace elements, kelp, molasses and humates. The potatoes are inoculated with mycorrhizal fungal spores at a rate of 5 kg (11 lb.) for each 4.5 metric tonne (5 ton) planter load.

Soil corrections are made the previous fall with the application of 4.5–6.5 metric tonnes (5–7 tons) of finished compost with added calcium and rock phosphate.

Following plant tissue sampling, Koenig carries out a foliar feeding program to correct deficiencies. The program includes fish fertilizer (if plant nitrogen is low), kelp to supply micronutrients, and humates. If needed, he adds manganese sulphate, boron (Solubor), silica (in the form of diatomaceous earth), copper sulphate, and citric acid (to lower the pH to between 5 and 6.4).

Hills are formed upon planting. These are worked

down shallowly with the harrow until the sprouts emerge. Koenig believes that potatoes in an organic environment respond well to aggressive cultivation. The last harrowing knocks off the first sprout that appears. The second sprout has improved vigour, resulting in a higher yield, as well as greater resistance to disease and pests.



In a separate pass, the soil is worked deeply between the hills with a 5-shank spring tine S-cultivator/scuffler. This provides weed-free, loose soil to rebuild the hills.

The last hilling is delayed until the potatoes are 10-cm (4-in.) high. The plowshare shape of the Harriston hiller has a gentle action; it pushes the soil up around the plant, instead of throwing it over the way a disk-style hiller does.

The canopy fills in quickly and discourages emerging weeds such as pigweed and lamb's quarters. Perennial weeds such as quackgrass have not been a problem because of the well planned crop rotation.

Potatoes are planted around May 24 and harvested beginning August 10, weather permitting. If necessary, plants are top-killed with a flail chopper. Koenig notes that in a weedy year, the weeds go through the harvester better if they are not chopped. In the future, he would like to add a pass with flamers or apply copper to the residue for added disease control.

Colorado potato beetles have not been a problem, but one year

Koenig had to spray the perimeter with spinosad (an organic insecticide developed from soil bacteria). He notes that the beetles appear to eat only the weak plants—distinguishing healthy plants with a high Brix (sugar) reading of 9 from those which are weak with a Brix reading of 3–6.

Leafhoppers can be a problem. They can cause tip burn, reduced yields and premature dieback. A loss of canopy can lead to an extremely weedy field at harvest. Leafhoppers are worse when the weather turns hot early in the summer. Some years, they arrive weekly by the millions on southerly warm winds that precede a low pressure front.

Koenig has found spinosad to be ineffective against leafhoppers. He has tried garlic spray

and a foliar spray of diatomaceous earth but neither was successful. Neem oil has been reported to be effective, although Koenig has not used it because it is not yet registered by Canada's Pest Management Regulatory Agency.

Klondyke Farms started to transition to organic in 2001 and became fully certified

organic in 2006. Over the years, potato yields have averaged 120 cwt or 13.4 tonnes per hectare (6 tons/ac.).

*An excerpt from Growing Potatoes Organically: from market garden to field crop and published by COG in 2008.*

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Whether you are an organic farmer interested in potatoes as a new cash crop or a conventional potato farmer considering transition to organic production methods, the second handbook in COG's Practical Skills series, *Growing Potatoes Organically: from market garden to field crop* can provide you with the practical skills to take to the field. The book covers potato production methods, strategies for preventing and dealing with pests and diseases, crop rotation, soil fertility and seed potato production. To order the book, see ad on page 39.